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10/591,464	09/01/2006	Toshiaki Kudo	295899US0PCT	1860

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EXAMINER	
SWOPE, SHERIDAN	
ART UNIT	PAPER NUMBER
1652	

NOTIFICATION DATE	DELIVERY MODE
10/02/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/591,464	KUDO ET AL.	
	Examiner	Art Unit	
	SHERIDAN SWOPE	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) *7-11* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☒ Claim(s) *4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1206*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicants' election with traverse of Invention I, in their response of July 9, 2008 is acknowledged. The elected invention is directed to a yeast strain transformed with an Os-1 histidine kinase gene. Applicants' traversal is based on the argument that no adequate reasons and/or examples have been provided to support a conclusion of patentable distinctiveness between the identified groups and there is no burden for examining all groups. This argument is not found to be persuasive. As explained in the prior action, the technical feature linking all claims is that they all relate to Os-1 histidine kinases, that Os-1 histidine kinases were well known in the art, and that Ochiai et al, 2001 in view of Fujimura et al, 2003 renders obvious the subject matter of Claims 1 and 3 (also see rejections below). Searching Group I (435/254.2) and Group II (435/15) would comprise an undue burden because, as indicated by their separate classifications, they have acquired a separate status in the art. The restriction requirement is still deemed proper and is therefore made FINAL.

Claims 1-11 are pending. Claims 7-11 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions, there being no allowable generic or linking claim. Claims 1-6 are hereby examined.

Priority

The priority date granted for the instant invention is March 4, 2005, the filing date of PCT/JP05/04272, which disclosed the elected invention. If Applicants wish to perfect their claim to priority to JP 2004-061273, an English translation thereof should be filed.

Information Disclosure Statement

Reference AQ of the Information Disclosure Statement filed December 14, 2006 has not been considered. If Applicants wish for said reference to be considered, an English translation thereof should be filed.

Abstract

The abstract is objected to because it appears to be too long.

MPEP 608.01(b) states

> The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

Claims-Objections

Claim 4 is objected to for poor grammar. The phrase "transformed with an expression vector of a filamentous fungus-derived Os-1…" would be better stated as "transformed with an expression vector comprising a filamentous fungus-derived Os-1…".

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-6 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The recited transformed yeast, as well as the combination of the transformed and untransformed yeast, may occur in nature. Thus the claims fail to show the "hand of man". It is suggested that "A yeast" be amended to "An isolated yeast".

Claim Rejections - 35 USC § 112-Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention for the following reasons.

For Claims 2 and 5, the phrase "HIK1 gene" renders the claim indefinite. It is unclear whether said phrase means only the rice blast fungus HIK1 gene of AB041647-1 or any gene encoding a protein having the activity of the HIK1 rice blast fungus histidine kinase. In addition, reference to a sequence by the GenBank Accession number is indefinite because the sequence disclosed by such a number often changes over time. The skilled artisan would not know the metes and bounds of the recited invention. Claims 3 and 6, as dependent from Claim 2 and 5, respectively, are indefinite for the same reason. For purposes of examination, it is assumed that HIK1 means any protein, with any structure, having any activity of the protein encoded by SEQ ID NO: 1.

Claim 4, line 4, is rendered indefinite for improper antecedent usage: the phrase "a filamentous fungus-specific enzyme" should be corrected to "the filamentous fungus-specific enzyme".

Claim Rejections - 35 USC § 112-First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Enablement

Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for Saccharomyces transformed with HIK1 (SEQ ID NO: 1; Example 1), does not reasonably provide enablement for any yeast transformed with any gene encoding any Os-1 histidine kinase. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

In regards to this enablement rejection, the application disclosure and claims are compared per the factors indicated in the decision In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). These factors are considered when determining whether there is sufficient evidence to support a description that a disclosure does not satisfy the enablement requirement and whether any necessary experimentation is undue. The factors include but are not limited to: (1) the nature of the invention; (2) the breath of the claims; (3) the predictability or unpredictability of the art; (4) the amount of direction or guidance presented; (5) the presence or absence of working examples; (6) the quantity of experimentation necessary; (7) the relative skill of those skilled in the art. Each factor is here addressed on the basis of a comparison of the disclosure, the claims, and the state of the prior art in the assessment of undue experimentation.

Claims 1, 3, 4, and 6 are so broad as to encompass any yeast, or Saccharomyces, transformed with any gene encoding any filamentous fungi-derived hybrid-type kinase comprising a histidine kinase domain, a response regulator domain, and a region exhibiting at least 50% identity with residues 171-700 of SEQ ID NO: 17. Claims 2 and 5 are so broad as to

encompass any yeast cells transformed with any gene encoding any protein, with any structure, and having any activity of the protein encoded by SEQ ID NO: 1.

The scope of each of these claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of yeast cells, transformed with an extremely large number of genes, as broadly encompassed by the claim. Since the amino acid sequence of a protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and obtain the desired Os-1 histidine kinase activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the protein's structure relates to its function. However, in this case the disclosure is limited to Saccharomyces transformed with SEQ ID NO: 1.

While kinase assay techniques are known, it is not routine in the art to screen an unlimited number of filamentous fungus genes for encoding a Os-1 histidine kinase having the characteristics of comprising a histidine kinase domain having any structure, a response regulator domain having any structure and any function, and a region having at least 50% identity to 171-700 of SEQ ID NO: 17 and having any or no function. Furthermore, the positions within a protein's sequence where amino acid modifications can occur with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the results of such modifications are unpredictable (Galye et al, 1993; Whisstock et al, 2003). In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions.

The specification does not support the broad scope of Claims 1, 3, 4, and 6, which encompasses all yeast, or Saccharomyces, cells transformed with any gene encoding any filamentous fungi-derived hybrid-type kinase comprising a histidine kinase domain, a response regulator domain, and a region exhibiting at least 50% identity with residues 171-700 of SEQ ID NO: 17. The specification does not support the broad scope of Claims 2 and 5, which encompasses all yeast cells transformed with any gene encoding any protein, with any structure, and having any activity of the protein encoded by SEQ ID NO: 1. The specification does not support the broad scope of Claims 1-6 because the specification does not establish: (A) the structure or function of all filamentous fungi-derived hybrid-type kinase comprising a histidine kinase domain, a response regulator domain, and a region exhibiting at least 50% identity with residues 171-700 of SEQ ID NO: 17; (B) all activities of the protein encoded by SEQ ID NO: 1; (C) the structure or function of filamentous fungi-derived hybrid-type kinases having any activity of the protein encoded by SEQ ID NO: 1; (D) regions of the protein structure which may be modified without affecting the desired activity; (E) the general tolerance of the desired activity to modification and extent of such tolerance; (F) a rational and predictable scheme for successfully identifying any sequences having the desired biological function; and (H) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any number of yeast cells comprising any Os-1 kinase. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re

Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of the identity of sequences having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Written Description

Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. These claims are directed to a genus of yeast cells transformed with any gene encoding any filamentous fungi-derived hybrid-type kinase comprising a histidine kinase domain, a response regulator domain, and a region exhibiting at least 50% identity with residues 171-700 of SEQ ID NO: 17. The specification teaches the structure of only a single representative species of such cells. Moreover, the specification fails to describe any other representative species by any identifying characteristics or properties other than the functionality of being a yeast cell transformed with any gene encoding any filamentous fungi-derived hybrid-type kinase comprising a histidine kinase domain, a response regulator domain, and a region exhibiting at least 50% identity with residues 171-700 of SEQ ID NO: 17. Given this lack of description of representative species encompassed by the genus of the claim, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that applicants were in possession of the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakajima et al, 2004 (IDS; filing date 31-OCT-2003). Nakajima et al teach Saccharomyces [0051] transformed with a gene encoding an Os-1 histidine kinase [0074], including HIK1 [0099; BAB40947], which has 94% identity with residues 171-700 of SEQ ID NO: 17, herein. Nakajima et al further teach a kit comprising the transformed and untransformed yeast [0183]. Therefore, Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakajima et al, 2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagahashi et al, 1998 (IDS). Nagahashi et al teach a C. albicans gene encoding an Os-1 histidine kinase, CaNIK1 (pg 427-430; Fig 2; AB006363), which has 56% identity with residues 171-700 of SEQ ID NO: 17, herein. Nagahashi et al do not teach Saccharomyces transformed with said gene.

Nagahashi et al further teach Saccharomyces pYES-SLN1, lacking ScSLN1, transformed with the C. albicans CaSLN1 gene (Fig 4). It would have been obvious to a person of ordinary skill in the art to combine the teachings of Nagahashi et al to produce Saccharomyces pYES-SLN1 transformed with the C. albicans CaNIK1 gene and compare the transformed cells to non-transformed cells. Motivation to do so derives from the following: (1) The desired to determine whether the CaSLN1 gene can functionally complement loss of ScSLN1, (2) recombinant production of the protein encoded by C. albicans CaNIK1, and (3) using the transformed cells to screen for C. albicans CaNIK1 modulators. The expectation of success is high, as transformation of Saccharomyces is well-known in the art. Therefore, Claims 1-6 are rejected under 35 U.S.C. 103(a), as being unpatentable over Nagahashi et al, 1998.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima et al, 2004 or Nagahashi et al, 1998 in view of Alex et al, 1996 (IDS). As explained above both Nakajima et al and Nagahashi et al teach or render obvious Saccharomyces transformed with an Os-1 histidine kinase. Neither Nakajima et al, Nagahashi et al, nor the combination thereof teach Saccharomyces transformed with the N. crassa NIK1 Os-1 kinase gene. Alex et al teach the N. crassa NIK1 Os-1 kinase cDNA (U50263), which encodes a protein having 100% identity with residues 171-700 of SEQ ID NO: 17, herein. It would have been obvious to a person of ordinary skill in the art to combine the teachings of Nakajima et al or Nagahashi et al to produce Saccharomyces transformed with the N. crassa NIK1 Os-1 kinase gene. Motivation to do so derives from the following: (1) The desired to determine whether the N. crassa NIK1 Os-1 kinase gene can functionally complement loss of ScSLN1, (2) recombinant production of the protein encoded by N. crassa NIK1 Os-1 kinase gene, and (3) using the transformed cells to

screen for N. crassa NIK1 Os-1 kinase modulators. The expectation of success is high, as transformation of Saccharomyces is well-known in the art. Therefore, Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima et al, 2004 or Nagahashi et al, 1998 in view of Alex et al, 1996.

Allowable Subject Matter

No claims are allowable.

Final Comments

To insure that each document is properly filed in the electronic file wrapper, it is requested that each of amendments to the specification, amendments to the claims, Applicants' remarks, requests for extension of time, and any other distinct papers be submitted on separate pages. It is also requested that the serial number of the application and date of amendment be referenced on every page of the response.

It is also requested that Applicants identify support, within the original application, for any amendments to the claims and specification.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheridan L. Swope whose telephone number is 571-272-0943. The examiner can normally be reached on M-F; 9:30-7 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Nashed can be reached on 571-272-0934. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/SHERIDAN SWOPE/
Primary Examiner, Art Unit 1652